EBERLINE SERVICES

February 22, 2005

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Avenue
Richland, WA 99352

Reference: **P.O. #630**
Eberline Services R4-12-300-7213, SDG H2936

Dear Mr. Trent:

Enclosed is the data report for one solid sample designated under SAF No. F03-006 received at Eberline Services on December 29, 2004. The sample was analyzed according to the accompanying chain-of-custody document.

Please call if you have any questions concerning this report.

Sincerely,

Melissa C. Mannion
Senior Program Manager

MCM/njv

Enclosure: Data Package

Analytical Services
2030 Wright Avenue
P.O. Box 4040
Richmond, California 94804-0040
(510) 235-2633 Fax (510) 235-0438
Toll Free (800) 841-5487
www.eberlineservices.com

1.0 GENERAL

Fluor Hanford Inc. (FH) Sample Delivery Group H2936 was composed of one solid (soil) sample designated under SAF No. F03-006 with a Project Designation of: 200-PW-2/200-PW-4 OU – Borehole Soil Sampling.

The sample was received as stated on the Chain-of-Custody document. Any discrepancies are noted on the Eberline Services Sample Receipt Checklist. The sample was analyzed in preparation batches with QC samples from SDG's H2925 (SAF No. F03-006) and H2936 (SAF No. F03-006).

2.0 ANALYSIS NOTES

2.1 Tritium Analyses

No problems were encountered during the course of the analyses.

2.2 Carbon-14 Analyses

No problems were encountered during the course of the analyses.

2.3 Nickel-63 Analyses

No problems were encountered during the course of the analyses.

2.4 Technetium-99 Analyses

No problems were encountered during the course of the analyses.

2.5 Iodine-129 Analyses

No problems were encountered during the course of the analyses.

2.6 Isotopic Thorium Analyses

No problems were encountered during the course of the analyses.

Case Narrative Certification Statement

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data obtained in this hard copy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Mel Mann
Melissa C. Mannion
Senior Program Manager

2/22/5
Date

E B E R L I N E S E R V I C E S / R I C H M O N D
SAMPLE DELIVERY GROUP H2936

SDG	7213
Contact	Melissa C. Mannion

Client	Hanford
Contract	No. 630
Case no	SDG H2936

S U M M A R Y D A T A S E C T I O N

T A B L E O F C O N T E N T S

Prepared by

Reviewed by

Lab id	EBRLNE
Protocol	Hanford
Version	Ver 1.0
Form	DVD-TOC
Version	3.06
Report date	02/22/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

SDG 7213
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2936

ABOUT THE DATA SUMMARY SECTION

The Data Summary Section of a Data Package has all data, in several useful orders, necessary for first level, routine review of the data package for a Sample Delivery Group (SDG). This section follows the Data Package Narrative, which has an overview of the data package and a discussion of special problems. It is followed by the Raw Data Section, which has full details.

The Data Summary Section has several groups of reports:

SAMPLE SUMMARIES

The Sample and QC Summary Reports show all samples, including QC samples, reported in one SDG. These reports cross-reference client and lab sample identifiers.

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches (lab groupings reflecting how work was organized) relevant to the reported SDG with information necessary to check the completeness and consistency of the SDG.

WORK SUMMARY

The Work Summary Report shows all samples and work done on them relevant to the reported SDG.

METHOD BLANKS

The Method Blank Reports, one for each Method Blank relevant to the SDG, show all results and primary supporting information for the blanks.

LAB CONTROL SAMPLES

The Lab Control Sample Reports, one for each Lab Control Sample relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/22/05

00000004

SDG 7213
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG_H2936

ABOUT THE DATA SUMMARY SECTION

DUPLICATES

The Duplicate Reports, one for each Duplicate and Original sample pair relevant to the SDG, show all results, differences and primary supporting information for these QC samples.

MATRIX SPIKES

The Matrix Spike Reports, one for each Spiked and Original sample pair relevant to the SDG, show all results, recoveries and primary supporting information for these QC samples.

DATA SHEETS

The Data Sheet Reports, one for each client sample in the SDG, show all results and primary supporting information for these samples.

METHOD SUMMARIES

The Method Summary Reports, one for each test used in the SDG, show all results, QC and method performance data for one analyte on one or two pages. (A test is a short code for the method used to do certain work to the client's specification.)

REPORT GUIDES

The Report Guides, one for each of the above groups of reports, have documentation on how to read the associated reports.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/22/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

SAMPLE SUMMARY

SDG 7213
Contact Melissa C. Mannion

Client Hanford
Contract No. 630
Case no SDG H2936

CLIENT SAMPLE ID	LOCATION	MATRIX	LEVEL	LAB SAMPLE ID	SAF NO	CHAIN OF CUSTODY	COLLECTED
B1B5F6	200-PW2/216S-7,199-201.5	SOLID		R412300-01	F03-006	F03-006-297	12/22/04 11:20
Method Blank		SOLID		R412178-04	F03-006		
Method Blank		SOLID		R501031-03	F03-006		
Lab Control Sample		SOLID		R412178-03	F03-006		
Lab Control Sample		SOLID		R501031-02	F03-006		
Duplicate (R412300-01)	200-PW2/216S-7,199-201.5	SOLID		R412300-04	F03-006		12/22/04 11:20

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SDG 7213
Contact Melissa C. Mannion

SAMPLE DELIVERY GROUP H2936

QC SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2936

C BATCH	CHAIN OF CUSTODY	CLIENT SAMPLE ID	MATRIX	% SOLIDS	SAMPLE AMOUNT	BASIS AMOUNT	DAYS SINCE RECEIVED	DAYS SINCE COLL	LAB SAMPLE ID	DEPARTMENT SAMPLE ID
194		Method Blank	SOLID						R412178-04	7194-004
		Lab Control Sample	SOLID						R412178-03	7194-003
213	F03-006-297	B1B5F6	SOLID	98.5	159 g		12/29/04	7	R412300-01	7213-001
		Duplicate (R412300-01)	SOLID	98.5	159 g		12/29/04	7	R412300-04	7213-004
229		Method Blank	SOLID						R501031-03	7229-003
		Lab Control Sample	SOLID						R501031-02	7229-002

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-QS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

SDG 7213
Contact Melissa C. Mannion

PREP BATCH SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2936

TEST	MATRIX	METHOD	PREPARATION BATCH	ERROR 2σ %	PLANCHETS ANALYZED CLIENT	MORE RE	BLANK	LCS	DUP/ORIG	MS/ORIG	QUALIFIERS
Alpha Spectroscopy											
TH	SOLID	Thorium, Isotopic in Solids	7121-118	5.0	1		1	1	1/1		
Beta Counting											
TC	SOLID	Technetium 99 in Solids	7113-070	10.0	1		1	1	1/1		
Gamma Spectroscopy											
I	SOLID	Iodine 129 in Solids	7113-070	10.0	1		1	1	1/1		
Liquid Scintillation Counting											
C	SOLID	Carbon 14 in Solids	7113-070	10.0	1		1	1	1/1		
H	SOLID	Tritium in Solids	7113-070	10.0	1		1	1	1/1		
NI_L	SOLID	Nickel 63 in Solids	7113-070	10.0	1		1	1	1/1		

Duplicates and Matrix Spikes are those with original (Client) sample in this Sample Delivery Group.
Blank and LCS planchets are those in the same preparation batch as some Client, Duplicate or Spike sample.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-PBS
Version 3.06
Report date 02/22/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

SDG 7213
Contact Melissa C. Mannion

WORK SUMMARY

Client Hanford
Contract No. 630
Case no SDG H2936

LIENT SAMPLE ID / OCATION / USTODY	MATRIX / SAF No	LAB SAMPLE ID / COLLECTED / RECEIVED	PLANCHET	TEST	SUF-FIX	ANALYZED	REVIEWED	BY	METHOD
1B5F6		R412300-01	7213-001	C		02/01/05	02/03/05	MWT	Carbon 14 in Solids
00-PW2/216S-7,199-201.5	SOLID	12/22/04	7213-001	H		02/03/05	02/15/05	MWT	Tritium in Solids
03-006-297	F03-006	12/29/04	7213-001	I		02/18/05	02/21/05	MWT	Iodine 129 in Solids
			7213-001	NI_L		02/06/05	02/16/05	MWT	Nickel 63 in Solids
			7213-001	TC		02/04/05	02/09/05	MWT	Technetium 99 in Solids
			7213-001	TH		02/08/05	02/09/05	MWT	Thorium, Isotopic in Solids
ethod Blank		R412178-04	7194-004	C		01/31/05	02/03/05	MWT	Carbon 14 in Solids
	SOLID		7194-004	H		02/03/05	02/15/05	MWT	Tritium in Solids
	F03-006		7194-004	I		02/14/05	02/15/05	MWT	Iodine 129 in Solids
			7194-004	NI_L		02/05/05	02/16/05	MWT	Nickel 63 in Solids
			7194-004	TC		02/08/05	02/09/05	MWT	Technetium 99 in Solids
ethod Blank		R501031-03	7229-003	TH		02/08/05	02/10/05	MWT	Thorium, Isotopic in Solids
	SOLID								
	F03-006								
ab Control Sample		R412178-03	7194-003	C		02/01/05	02/03/05	MWT	Carbon 14 in Solids
	SOLID		7194-003	H		02/03/05	02/15/05	MWT	Tritium in Solids
	F03-006		7194-003	I		02/13/05	02/15/05	MWT	Iodine 129 in Solids
			7194-003	NI_L		02/05/05	02/16/05	MWT	Nickel 63 in Solids
			7194-003	TC		02/04/05	02/09/05	MWT	Technetium 99 in Solids
ab Control Sample		R501031-02	7229-002	TH		02/08/05	02/10/05	MWT	Thorium, Isotopic in Solids
	SOLID								
	F03-006								
uplicate (R412300-01)		R412300-04	7213-004	C		02/01/05	02/03/05	MWT	Carbon 14 in Solids
00-PW2/216S-7,199-201.5	SOLID	12/22/04	7213-004	H		02/03/05	02/15/05	MWT	Tritium in Solids
	F03-006	12/29/04	7213-004	I		02/18/05	02/21/05	MWT	Iodine 129 in Solids
			7213-004	NI_L		02/06/05	02/16/05	MWT	Nickel 63 in Solids
			7213-004	TC		02/04/05	02/09/05	MWT	Technetium 99 in Solids
			7213-004	TH		02/08/05	02/09/05	MWT	Thorium, Isotopic in Solids

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

SDG 7213
Contact Melissa C. Mannion

WORK SUMMARY, cont.

Client Hanford
Contract No. 630
Case no SDG H2936

COUNTS OF TESTS BY SAMPLE TYPE

TEST	SAF No	METHOD	REFERENCE	CLIENT	MORE	RE	BLANK	LCS	DUP SPIKE	TOTAL
C	F03-006	Carbon 14 in Solids	C14_COX_LSC	1			1	1	1	4
H	F03-006	Tritium in Solids	906.0_H3_LSC	1			1	1	1	4
I	F03-006	Iodine 129 in Solids	I129_SEP_LEPS_GS	1			1	1	1	4
NI_L	F03-006	Nickel 63 in Solids	NI63_LSC	1			1	1	1	4
TC	F03-006	Technetium 99 in Solids	TC99_TR_SEP_LSC	1			1	1	1	4
TH	F03-006	Thorium, Isotopic in Solids	THISO_IE_PLATE_AEA	1			1	1	1	4
TOTALS				6			6	6	6	24

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CWS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2936

R412178-04 **Method Blank**

METHOD BLANK

SDG 7213	Client/Case no Hanford	SDG H2936	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R412178-04	Client sample id Method Blank		
Dept sample id 7194-004	Material/Matrix	SOLID	
	SAF No F03-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	-0.076	0.25	0.44	400	U	H
Carbon 14	14762-75-5	-2.83	2.0	3.6	50	U	C
Nickel 63	13981-37-8	-1.01	1.8	3.1	30	U	NI_L
Technetium 99	14133-76-7	0.243	0.28	0.51	15	U	TC
Thorium 228	14274-82-9	N.A.			1.0		TH
Thorium 230	14269-63-7	N.A.			1.0		TH
Thorium 232	TH-232	N.A.			1.0		TH
Iodine 129	15046-84-1	-0.008	0.35	0.80	2.0	U	I

200-PW-2/200-PW-4 OU Boreh.Soil Samp

QC-BLANK #51347

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2936

R501031-03 **Method Blank**

METHOD BLANK

SDG 7213	Client/Case no Hanford	SDG H2936	
Contact Melissa C. Mannion	Contract No. 630		
Lab sample id R501031-03	Client sample id Method Blank		
Dept sample id 7229-003	Material/Matrix	SOLID	
	SAF No F03-006		

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Thorium 228	14274-82-9	0	0.048	0.098	1.0	U	TH
Thorium 230	14269-63-7	-0.016	0.11	0.21	1.0	U	TH
Thorium 232	TH-232	-0.016	0.032	0.076	1.0	U	TH

200-PW-2/200-PW-4 OU Boreh.Soil Samp

QC-BLANK 51525

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/22/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

R412178-03

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7213

Contact Melissa C. Mannion

Client/Case no Hanford SDG H2936

Contract No. 630

Lab sample id R412178-03

Dept sample id 7194-003

Client sample id Lab Control Sample

Material/Matrix SOLID

SAF No F03-006

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Tritium	13.4	0.64	0.44	400		H	13.0	0.52	103	82-118	80-120
Carbon 14	1620	33	7.9	50		C	1600	64	101	83-117	80-120
Nickel 63	273	6.6	3.1	30		NI_L	272	11	100	83-117	80-120
Technetium 99	120	2.3	0.49	15		TC	120	4.8	100	84-116	80-120
Thorium 230	N.A.			1.0		TH					80-120
Iodine 129	134	2.0	3.0	2.0		I	127	5.1	106	83-117	80-120

200-PW-2/200-PW-4 OU Boreh.Soil Samp

QC-LCS #51346

Lab id EBRLNE

Protocol Hanford

Version Ver 1.0

Form DVD-LCS

Version 3.06

Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

R501031-02

Lab Control Sample

LAB CONTROL SAMPLE

SDG 7213
Contact Melissa C. Mannion

Client/Case no Hanford SDG H2936
Contract No. 630

Lab sample id R501031-02
Dept sample id 7229-002

Client sample id Lab Control Sample
Material/Matrix SOLID
SAF No F03-006

ANALYTE	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ADDED pCi/g	2σ ERR pCi/g	REC %	3σ LMTS (TOTAL)	PROTOCOL LIMITS
Thorium 230	46.1	5.2	0.35	1.0		TH	46.4	1.9	99	81-119	80-120

200-PW-2/200-PW-4 OU Boreh.Soil Samp

QC-LCS 51524

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-LCS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

R412300-04 B1B5F6

DUPLICATE

SDG 7213		Client/Case no Hanford	SDG H2936
Contact Melissa C. Mannion		Contract No. 630	
DUPLICATE	ORIGINAL		
Lab sample id R412300-04	Lab sample id R412300-01	Client sample id B1B5F6	
Dept sample id 7213-004	Dept sample id 7213-001	Location/Matrix 200-PW2/216S-7,199-201.5	SOLID
	Received 12/29/04	Collected/Weight 12/22/04 11:20	159 g
% solids 98.5	% solids 98.5	Custody/SAF No F03-006-297	F03-006

ANALYTE	DUPLICATE pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST	ORIGINAL pCi/g	2σ ERR (COUNT)	MDA pCi/g	QUALI-FIERS	RPD %	3σ PROT TOT LIMIT
Tritium	177	5.6	1.2	400		H	158	5.0	1.1		11	22
Carbon 14	-1.96	1.8	3.1	50	U	C	-1.09	1.7	3.0	U	-	
Nickel 63	0.758	2.0	3.3	30	U	NI_L	-1.22	1.9	3.3	U	-	
Technetium 99	0.198	0.32	0.56	15	U	TC	0.131	0.28	0.72	U	-	
Thorium 228	0.349	0.23	0.30	1.0		TH	0.721	0.39	0.37		70	128
Thorium 230	0.232	0.23	0.30	1.0	U	TH	0.384	0.39	0.37		49	221
Thorium 232	0.426	0.24	0.30	1.0		TH	0.576	0.29	0.37		30	113
Iodine 129	0.318	0.67	1.5	2.0	U	I	0.118	0.71	1.6	U	-	

200-PW-2/200-PW-4 OU Boreh.Soil Samp

QC-DUP#1 51823

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DUP
Version 3.06
Report date 02/22/05

EBERLINE SERVICES / RICHMOND

SAMPLE DELIVERY GROUP H2936

R412300-01 **B1B5F6**

DATA SHEET

SDG	7213	Client/Case no	Hanford SDG H2936
Contact	Melissa C. Mannion	Contract	No. 630
Lab sample id	R412300-01	Client sample id	B1B5F6
Dept sample id	7213-001	Location/Matrix	200-PW2/216S-7,199-201.5 SOLID
Received	12/29/04	Collected/Weight	12/22/04 11:20 159 g
% solids	98.5	Custody/SAF No	F03-006-297 F03-006

ANALYTE	CAS NO	RESULT pCi/g	2σ ERR (COUNT)	MDA pCi/g	RDL pCi/g	QUALI-FIERS	TEST
Tritium	10028-17-8	158	5.0	1.1	400		H
Carbon 14	14762-75-5	-1.09	1.7	3.0	50	U	C
Nickel 63	13981-37-8	-1.22	1.9	3.3	30	U	NI_L
Technetium 99	14133-76-7	0.131	0.28	0.72	15	U	TC
Thorium 228	14274-82-9	0.721	0.39	0.37	1.0		TH
Thorium 230	14269-63-7	0.384	0.39	0.37	1.0		TH
Thorium 232	TH-232	0.576	0.29	0.37	1.0		TH
Iodine 129	15046-84-1	0.118	0.71	1.6	2.0	U	I

200-PW-2/200-PW-4 OU Boreh.Soil Samp

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-DS
Version 3.06
Report date 02/22/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

Test TH Matrix SOLID
SDG 7213
Contact Melissa C. Mannion

METHOD SUMMARY

THORIUM, ISOTOPIC IN SOLIDS
ALPHA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2936

:ESULTS

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Thorium 230	
reparation batch 7121-118						
1B5F6	R412300-01			7213-001	0.384	
LK (QC ID=51525)	R501031-03			7229-003	U	
CS (QC ID=51524)	R501031-02			7229-002	ok	
uplicate (R412300-01)	R412300-04			7213-004	ok	U
ominal values and limits from method				RDLs (pCi/g)	1.0	
00-PW-2/200-PW-4 OU Boreh.Soil Samp						

IETHOD PERFORMANCE

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MAX MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
reparation batch 7121-118	2σ prep error 5.0 %			Reference Lab Notebook 7121 pg. 118												
1B5F6	R412300-01			0.37	0.250			78		162			48	02/08/05	02/08	SS-063
LK (QC ID=51525)	R501031-03			0.21	0.250			79		876				02/08/05	02/08	SS-035
CS (QC ID=51524)	R501031-02			0.35	0.250			75		162				02/08/05	02/08	SS-066
uplicate (R412300-01) (QC ID=51823)	R412300-04			0.30	0.250			86		162			48	02/08/05	02/08	SS-064
ominal values and limits from method				1.0	0.250			20-105		150			180			

PROCEDURES	REFERENCE	THISO_IE_PLATE_AEA
	CP-060	Soil Preparation, rev 7
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 5
	CP-900	Thorium in Water and Dissolved Solid Samples by Extraction Chromatography, rev 1
	CP-008	Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.31 ± 0.14
YIELD 80 ± 9

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/22/05

0000017

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

Test TC Matrix SOLID
SDG 7213
Contact Melissa C. Mannion

METHOD SUMMARY

TECHNETIUM 99 IN SOLIDS
BETA COUNTING

Client Hanford
Contract No. 630
Contract SDG H2936

RESULTS

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Technetium 99	
reparation batch 7113-070						
1B5F6	R412300-01			7213-001	U	
LK (QC ID=51347)	R412178-04			7194-004	U	
CS (QC ID=51346)	R412178-03			7194-003	ok	
uplicate (R412300-01)	R412300-04			7213-004	-	U
ominal values and limits from method				RDLs (pCi/g)	15	
00-PW-2/200-PW-4 OU Boreh.Soil Samp						

METHOD PERFORMANCE

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
reparation batch 7113-070 2σ prep error 10.0 % Reference Lab Notebook 7113 pg. 070																
1B5F6	R412300-01			0.72	1.00			71		50			44	02/01/05	02/04	GRB-202
LK (QC ID=51347)	R412178-04			0.51	1.00			102		50				02/01/05	02/08	GRB-227
CS (QC ID=51346)	R412178-03			0.49	1.00			103		50				02/01/05	02/04	GRB-203
uplicate (R412300-01) (QC ID=51823)	R412300-04			0.56	1.00			90		50			44	02/01/05	02/04	GRB-203
ominal values and limits from method				15	1.00			20-105		50			180			

PROCEDURES
REFERENCE CP-431 Technetium-99 Purification of Soil or Resin by Extraction Chromatography, rev 2
REFERENCE CP-008 Heavy Element Electroplating, rev 9

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.57 ± 0.21
YIELD 92 ± 30

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/22/05

00000018

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

Test I Matrix SOLID
SDG 7213
Contact Melissa C. Mannion

METHOD SUMMARY

IODINE 129 IN SOLIDS
GAMMA SPECTROSCOPY

Client Hanford
Contract No. 630
Contract SDG H2936

RESULTS

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	PLANCHET	Iodine 129	
reparation batch 7113-070						
1B5F6	R412300-01			7213-001	U	
LK (QC ID=51347)	R412178-04			7194-004	U	
CS (QC ID=51346)	R412178-03			7194-003	ok	
uplicate (R412300-01)	R412300-04			7213-004	-	U
ominal values and limits from method				RDLs (pCi/g)	2.0	
00-PW-2/200-PW-4 OU Boreh.Soil Samp						

METHOD PERFORMANCE

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF- FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU- TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL- YZED	DETECTOR
reparation batch 7113-070	2σ prep error 10.0 % Reference Lab Notebook 7113 pg. 070															
1B5F6	R412300-01			1.6	1.00			44		719			58	02/10/05	02/18	XSPEC-004
LK (QC ID=51347)	R412178-04			0.80	1.00			95		601				02/10/05	02/14	XSPEC-004
CS (QC ID=51346)	R412178-03			3.0	1.00			52		961				02/10/05	02/13	XSPEC-002
uplicate (R412300-01) (QC ID=51823)	R412300-04			1.5	1.00			39		908			58	02/10/05	02/18	XSPEC-004
ominal values and limits from method				2.0	1.00			20-105		300			180			

PROCEDURES	REFERENCE	I129_SEP_LEPS_GS
	CP-024	Iodine-129, Sample Dissolution, rev 5
	CP-530	Iodine-129 Purification, rev 1

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 1.7 ± 1.8
YIELD 58 ± 51

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/22/05

0000019

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

Test C Matrix SOLID
SDG 7213
Contact Melissa C. Mannion

METHOD SUMMARY

CARBON 14 IN SOLIDS

LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2936

:ESULTS

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Carbon 14	
reparation batch 7113-070						
1B5F6	R412300-01			7213-001	U	
LK (QC ID=51347)	R412178-04			7194-004	U	
CS (QC ID=51346)	R412178-03			7194-003	ok	
uplicate (R412300-01)	R412300-04			7213-004	-	U
ominal values and limits from method				RDLs (pCi/g)	50	
00-PW-2/200-PW-4 OU Boreh.Soil Samp						

IETHOD PERFORMANCE

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
reparation batch 7113-070 2σ prep error 10.0 % Reference Lab Notebook 7113 pg. 070																
1B5F6	R412300-01			3.0	0.471			100		50			41	01/30/05	02/01	LSC-004
LK (QC ID=51347)	R412178-04			3.6	0.400			100		50				01/30/05	01/31	LSC-004
CS (QC ID=51346)	R412178-03			7.9	0.400			100		10				01/30/05	02/01	LSC-004
uplicate (R412300-01) (QC ID=51823)	R412300-04			3.1	0.459			100		50			41	01/30/05	02/01	LSC-004
ominal values and limits from method				50	0.400					25			180			

PROCEDURES REFERENCE C14_COX_LSC
CP-251 Tritium/Carbon-14 Oxidation, rev 8

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 4.4 ± 4.7
YIELD 100 ± 0

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/22/05

EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

Test H Matrix SOLID
SDG 7213
Contact Melissa C. Mannion

METHOD SUMMARY

TRITIUM IN SOLIDS
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2936

RESULTS

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Tritium
Preparation batch 7113-070					
1B5F6	R412300-01			7213-001	158
LK (QC ID=51347)	R412178-04			7194-004	U
CS (QC ID=51346)	R412178-03			7194-003	ok
Duplicate (R412300-01)	R412300-04			7213-004	ok
Nominal values and limits from method				RDLs (pCi/g)	400
200-PW-2/200-PW-4 OU Boreh.Soil Samp					

METHOD PERFORMANCE

CLIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT keV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
Preparation batch 7113-070	2σ prep error 10.0 % Reference Lab Notebook 7113 pg. 070															
1B5F6	R412300-01			1.1	20.9			35		7			43	02/03/05	02/03	LSC-007
LK (QC ID=51347)	R412178-04			0.44	20.0			33		50				02/03/05	02/03	LSC-007
CS (QC ID=51346)	R412178-03			0.44	20.0			33		50				02/03/05	02/03	LSC-007
Duplicate (R412300-01) (QC ID=51823)	R412300-04			1.2	20.6			34		7			43	02/03/05	02/03	LSC-007
Nominal values and limits from method				400	20.0					25			180			

PROCEDURES REFERENCE 906.0_H3_LSC
CP-218 Tritium in Soil Samples by Azeotropic Distillation, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 0.80 ± 0.82
YIELD 34 ± 2

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

Test NI L Matrix SOLID
SDG 7213
Contact Melissa C. Mannion

METHOD SUMMARY

NICKEL 63 IN SOLIDS
LIQUID SCINTILLATION COUNTING

Client Hanford
Contract No. 630
Contract SDG H2936

:ESULTS

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	PLANCHET	Nickel 63	
reparation batch 7113-070						
1B5F6	R412300-01			7213-001	U	
LK (QC ID=51347)	R412178-04			7194-004	U	
CS (QC ID=51346)	R412178-03			7194-003	ok	
uplicate (R412300-01)	R412300-04			7213-004	-	U
ominal values and limits from method				RDLs (pCi/g)	30	
00-PW-2/200-PW-4 OU Boreh.Soil Samp						

IETHOD PERFORMANCE

LIENT SAMPLE ID	LAB SAMPLE ID	RAW TEST	SUF-FIX	MDA pCi/g	ALIQ g	PREP FAC	DILU-TION	YIELD %	EFF %	COUNT min	FWHM keV	DRIFT KeV	DAYS HELD	PREPARED	ANAL-YZED	DETECTOR
reparation batch 7113-070 2σ prep error 10.0 % Reference Lab Notebook 7113 pg. 070																
1B5F6	R412300-01			3.3	0.500			90		50			46	02/04/05	02/06	LSC-007
LK (QC ID=51347)	R412178-04			3.1	0.500			94		50				02/04/05	02/05	LSC-007
CS (QC ID=51346)	R412178-03			3.1	0.500			94		50				02/04/05	02/05	LSC-007
uplicate (R412300-01) (QC ID=51823)	R412300-04			3.3	0.500			87		50			46	02/04/05	02/06	LSC-007
ominal values and limits from method				30	0.500			30-105		25			180			

PROCEDURES	REFERENCE	NI63_LSC
	CP-060	Soil Preparation, rev 7
	CP-071	Soil Dissolution, > 1.0g Aliquot, rev 5
	CP-280	Nickel-63 Purification, rev 3

AVERAGES ± 2 SD FOR 4 SAMPLES
MDA 3.2 ± 0.23
YIELD 91 ± 7

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-CMS
Version 3.06
Report date 02/22/05

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EBERLINE SERVICES/RICHMOND

SAMPLE DELIVERY GROUP H2936

SDG 7213
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2936

SAMPLE SUMMARY

The Sample and QC Summary Reports show all samples, including QC samples, reported in one Sample Delivery Group (SDG).

The Sample Summary Report fully identifies client samples and gives the corresponding lab sample identification. The QC Summary Report shows at the sample level how the lab organized the samples into batches and generated QC samples. The Preparation Batch and Method Summary Reports show this at the analysis level.

The following notes apply to these reports:

* LAB SAMPLE ID is the lab's primary identification for a sample.

* DEPARTMENT SAMPLE ID is an alternate lab id, for example one assigned by a radiochemistry department in a lab.

* CLIENT SAMPLE ID is the client's primary identification for a sample. It includes any sample preparation done by the client that is necessary to identify the sample.

* QC BATCH is a lab assigned code that groups samples to be processed and QCed together. These samples should have similar matrices.

  QC BATCH is not necessarily the same as SDG, which reflects samples received and reported together.

* All Lab Control Samples, Method Blanks, Duplicates and Matrix Spikes are shown that QC any of the samples. Due to possible reanalyses, not all results for all these QC samples may be relevant to the SDG. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/22/05

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SDG 7213
Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2936

PREPARATION BATCH SUMMARY

The Preparation Batch Summary Report shows all preparation batches in one Sample Delivery Group (SDG) with information necessary to check the completeness and consistency of the SDG.

The following notes apply to this report:

* The preparation batches are shown in the same order as the Method Summary Reports are printed.

* Only analyses of planchets relevant to the SDG are included.

* Each preparation batch should have at least one Method Blank and LCS in it to validate client sample results.

* The QUALIFIERS shown are all qualifiers other than U, J, B, L and H that occur on any analysis in the preparation batch. The Method Summary Report has these qualifiers on a per sample basis.

  These qualifiers should be reviewed as follows:

  X Some data has been manually entered or modified. Transcription errors are possible.

  P One or more results are 'preliminary'. The data is not ready for final reporting.

  2 There were two or more results for one analyte on one planchet imported at one time. The results in DVD may not be the same as on the raw data sheets.

  Other lab defined qualifiers may occur. In general, these should be addressed in the SDG narrative.

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SAMPLE DELIVERY GROUP H2936

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REPORT GUIDE

Client Hanford
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WORK SUMMARY

The Work Summary Report shows all samples, including QC samples, and all relevant analyses in one Sample Delivery Group (SDG). This report is often useful as supporting documentation for an invoice.

The following notes apply to this report:

* TEST is a code for the method used to measure associated analytes. Results and related information for each analyte are on the Data Sheet Report. In special cases, a test code used in the summary data section is not the same as in associated raw data. In this case, both codes are shown on the Work Summary.

* SUFFIX is the lab's code to distinguish multiple analyses (recounts, reworks, reanalyses) of a fraction of the sample. The suffix indicates which result is being reported. An empty suffix normally identifies the first attempt to analyze the sample.

* The LAB SAMPLE ID, TEST and SUFFIX uniquely identify all supporting data for a result. The Method Summary Report for each TEST has method performance data, such as yield, for each lab sample id and suffix and procedures used in the method.

* PLANCHET is an alternate lab identifier for work done for one test. It, combined with the TEST and SUFFIX, may be the best link to raw data.

* For QC samples, only analyses that directly QC some regular sample are shown. The Lab Control Sample, Method Blank, Duplicate, Matrix Spike and Method Summary Reports detail these relationships.

* The SAS (Special Analytical Services) Number is a client or lab assigned code that reflects special processing for samples, such as rapid turn around. Counts of tests done are lists by SAS number since it is likely to affect prices.

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DATA SHEET

The Data Sheet Report shows all results and primary supporting information for one client sample or Method Blank. This report corresponds to both the CLP Inorganics and Organics Data Sheet.

The following notes apply to this report:

* TEST is a code for the method used to measure an analyte. If the TEST is empty, no data is available; the analyte was not analyzed for.

* The LAB SAMPLE ID and TEST uniquely identify work within the Summary Data Section of a Data Package. The Work Summary and Method Summary Reports further identify raw data that underlies this work.

  The Method Summary Report for each TEST has method performance data, such as yield, for each Lab Sample ID and a list of procedures used in the method.

* ERRORs can be labeled TOTAL or COUNT. TOTAL implies a preparation (non-counting method) error has been added, as square root of sum of squares, to the counting error denoted by COUNT. The preparation errors, which may vary by preparation batch, are shown on the Method Summary Report.

* A RESULT can be 'N.R.' (Not Reported). This means the lab did this work but chooses not to report it now, possibly because it was reported at another time.

* When reporting a Method Blank, a RESULT can be 'N.A.' (Not Applicable). This means there is no reported client sample work in the same preparation batch as the Blank's result. This is likely to occur when the Method Blank is associated with reanalyses of selected work for a few samples in the SDG.

The following qualifiers are defined by the DVD system:

U The RESULT is less than the MDA (Minimum Detectable Activity).

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GUIDE, cont.

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DATA SHEET

If the MDA is blank, the ERROR is used as the limit.

J The RESULT is less than the RDL (Required Detection Limit) and no U qualifier is assigned.

B A Method Blank associated with this sample had a result without a U flag and, after correcting for possibly different aliquots, that result is greater than or equal to the MDA for this sample.

Normally, B is not assigned if U is. When method blank subtraction is shown on this report, B flags are assigned based on the unsubtracted values while U's are assigned based on the subtracted ones. Both flags can be assigned in this case.

For each sample result, all Method Blank results in the same preparation batch are compared. The Method Summary Report documents this and other QC relationships.

L Some Lab Control Sample that QC's this sample had a low recovery. The lab can disable assignment of this qualifier.

H Similar to 'L' except the recovery was high.

P The RESULT is 'preliminary'.

X Some data necessary to compute the RESULT, ERROR or MDA was manually entered or modified.

2 There were two or more results available for this analyte. The reported result may not be the same as in the raw data.

Other qualifiers are lab defined. Definitions should be in the SDG narrative.

The following values are underlined to indicate possible problems:

* An MDA is underlined if it is bigger than its RDL.

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Contact Melissa C. Mannion

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Client Hanford
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DATA SHEET

* An ERROR is underlined if the 1.645 sigma counting error is bigger than both the MDA and the RESULT, implying that the MDA may not be a good estimate of the 'real' minimum detectable activity.

* A negative RESULT is underlined if it is less than the negative of its 2 sigma counting ERROR.

* When reporting a Method Blank, a RESULT is underlined if greater than its MDA. If the MDA is blank, the 2 sigma counting error is used in the comparison.

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Protocol Hanford
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Form DVD-RG
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Contact Melissa C. Mannion

REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2936

LAB CONTROL SAMPLE

The Lab Control Sample Report shows all results, recoveries and primary supporting information for one Lab Control Sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. Refer to its Report Guide for details.

* An amount ADDED is the lab's value for the actual amount spiked into this sample with its ERROR an estimate of the error of this amount.

  An amount added is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The error of RESULT, including that introduced by rounding the result prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits for the recovery.

* The recovery is underlined if it is outside either of these ranges.

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REPORT GUIDE

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Case no SDG H2936

DUPLICATE

The Duplicate Report shows all results, differences and primary supporting information for one Duplicate and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Duplicate and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Duplicate has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* The RPD (Relative Percent Difference) is the absolute value of the difference of the RESULTs divided by their average expressed as a percent.

  If both RESULTs are less than their MDAs, no RPD is computed and a '-' is printed.

  For an analyte, if the lab did work for both samples but has data for only one, the MDA from the sample with data is used as the other's result in the RPD.

* The first, computed limit is the sum, as square root of sum of squares, of the errors of the results divided by the average result as a percent, hence the relative error of the difference rather than the error of the relative difference. The errors include those introduced by rounding the RESULTs prior to printing.

  If this limit is labeled TOT, it includes the preparation error in the RESULTs. If labeled CNT, it does not.

  This value reported for this limit is at most 999.

* The second limit for the RPD is the larger of:

  1. A fixed percentage specified in the protocol.

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/22/05

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GUIDE, cont.

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DUPLICATE

2. A protocol factor (typically 2) times the average MDA as a percent of the average result. This limit applies when the results are close to the MDAs.

* The RPD is underlined if it is greater than either limit.

* If specified by the lab, the second limit column is replaced by the Difference Error Ratio (DER), which is the absolute value of the difference of the results divided by the quadratic sum of their one sigma errors, the same errors as used in the first limit.

  Except for differences due to rounding, the DER is the same as the RPD divided by the first RPD limit with the limit scaled to 1 sigma.

* The DER is underlined if it is greater than the sigma factor, typically 2 or 3, shown in the header for the first RPD limit.

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Protocol Hanford
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Client Hanford
Contract No. 630
Case no SDG_H2936

MATRIX SPIKE

The Matrix Spike Report shows all results, recoveries and primary supporting information for one Matrix Spike and associated Original sample.

The following notes apply to this report:

* All fields in common with the Data Sheet Report have similar usage. This applies both to the Spiked and Original sample data. Refer to the Data Sheet Report Guide for details.

  If the Spike has data for a TEST and the lab did not do this test to the Original, the Original's RESULTs are underlined.

* An amount ADDED is the lab's value for the actual amount spiked into the Spike sample with its ERROR an estimate of the error of this amount.

  An amount is underlined if its ratio to the corresponding RDL is outside protocol specified limits.

* REC (Recovery) is the Spike RESULT minus the Original RESULT divided by ADDED expressed as a percent.

* The first, computed limits for the recovery reflect:

  1. The errors of the two RESULTs, including those introduced by rounding them prior to printing.

     If the limits are labeled (TOTAL), they include preparation error in the result. If labeled (COUNT), they do not.

  2. The error of ADDED.

  3. A lab specified, per analyte bias. The bias changes the center of the computed limits.

* The second limits are protocol defined upper and lower QC limits

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Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/22/05

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SDG 7213
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
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Case no SDG_H2936

MATRIX SPIKE

for the recovery.

These limits are left blank if the Original RESULT is more than a protocol defined factor (typically 4) times ADDED. This is a way of accounting for that when the spike is small compared to the amount in the original sample, the recovery is unreliable.

* The recovery is underlined (out of spec) if it is outside either of these ranges.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
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SDG 7213
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REPORT GUIDE

Client Hanford
Contract No. 630
Case no SDG H2936

METHOD SUMMARY

The Method Summary Report has two tables. One shows up to five results measured using one method. The other has performance data for the method. There is one report for each TEST, as used on the Data Sheet Report.

The following notes apply to this report:

* Each table is subdivided into sections, one for each preparation batch. A preparation batch is a group of aliquots prepared at roughly the same time in one work area of the lab using the same method.

  There should be Lab Control Sample and Method Blank results in each preparation batch since this close correspondence makes the QC meaningful. Depending on lab policy, Duplicates need not occur in each batch since they QC sample dependencies such as matrix effects.

* The RAW TEST column shows the test code used in the raw data to identify a particular analysis if it is different than the test code in the header of the report. This occurs in special cases due to method specific details about how the lab labels work.

  The Lab Sample or Planchet ID combined with the (Raw) Test Code and Suffix uniquely identify the raw data for each analysis.

* If a result is less than both its MDA and RDL, it is replaced by just 'U' on this report. If it is greater than or equal to the RDL but less than the MDA, the result is shown with a 'U' flag.

  The J and X flags are as on the data sheet.

* Non-U results for Method Blanks are underlined to indicate possible contamination of other samples in the preparation batch. The Method Blank Report has supporting data.

* Lab Control Sample and Matrix Spike results are shown as: ok, No data, LOW or HIGH, with the last two underlined. 'No data'

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METHOD SUMMARY

means no amount ADDED was specified. 'LOW' and 'HIGH' correspond to when the recovery is underlined on the Lab Control Sample or Matrix Spike Report. See these reports for supporting data.

* Duplicate sample results are shown as: ok, No data, or OUT, with the last two underlined. 'No data' means there was no original sample data found for this duplicate. 'OUT' corresponds to when the RPD is underlined on the Duplicate Report. See this report for supporting data.

* If the MDA column is labeled 'MAX MDA', there was more than one result measured by the reported method and the MDA shown is the largest MDA. If not all these results have the same RDL, the MAX MDA reflects only those results with RDL equal to the smallest one.

  MDAs are underlined if greater than the printed RDL.

* Aliquots are underlined if less than the nominal value specified for the method.

* Prepareation factors are underlined if greater than the nominal value specified for the method.

* Dilution factors are underlined if greater than the nominal value specified for the method.

* Residues are underlined if outside the range specified for the method. Residues are not printed if yields are.

* Yields, which may be gravimetric, radiometric or some type of recovery depending on the method, are underlined if outside the range specified for the method.

* Efficiencies are underlined if outside the range specified for the method. Efficiencies are detector and geometry dependent so this test is only approximate.

METHOD SUMMARY

* Count times are underlined if less than the nominal value specified for the method.

* Resolutions (as FWHM; Full Width at Half Max) are underlined if greater than the method specified limit.

* Tracer drifts are underlined if their absolute values are greater than the method specified limit. Tracer drifts are not printed if percent moistures are.

* Days Held are underlined if greater than the holding time specified in the protocol.

* Analysis dates are underlined if before their planchet's preparation date or, if a limit is specified, too far after it.

For some methods, ratios as percentages and error estimates for them are computed for pairs of results. A ratio column header like '1+3' means the ratio of the first result column and the third result column.

Ratios are not computed for Lab Control Sample, Method Blank or Matrix Spike results since their matrices are not necessarily similar to client samples'.

The error estimate for a ratio of results from one planchet reflects only counting errors since other errors should be correlated. For a ratio involving different planchets, if QC limits are computed based on total errors, the error for the ratio allows for the preparation errors for the planchets.

The ratio is underlined (out of spec) if the absolute value of its difference from the nominal value is greater than its error estimate. If no nominal value is specified, this test is not done.

For Gross Alpha or Gross Beta results, there may be a column showing the sum of other Alpha or Beta emitters. This sum includes all relevant

SDG 7213
Contact Melissa C. Mannion

GUIDE, cont.

Client Hanford
Contract No. 630
Case no SDG H2936

METHOD SUMMARY

results in the DVD database, whether reported or not. Results in the sum are weighted by a particles/decay value specified by the lab for each relevant analyte. Results less than their MDA are not included. No sums are computed for Lab Control, Method Blank or Matrix Spike samples since their various planchets may not be physically related.

If a ratio of total isotopic to Gross Alpha or Beta is shown, the error for the ratio reflects both the error in the Gross result and the sum, as square root of sum of squares, of the errors in the isotopic results.

For total elemental uranium or thorium results, there may be a column showing the total weight computed from associated isotopic results. Ignoring results less than their MDAs, this is a weighted sum of the isotopic results. The weights depend on the molecular weight and half-life of each isotope so as to convert activities (decays) to weight (atoms).

If a ratio of total computed to measured elemental uranium or thorium is shown, the error for the ratio reflects the errors in all the measurements.

Lab id EBRLNE
Protocol Hanford
Version Ver 1.0
Form DVD-RG
Version 3.06
Report date 02/22/05

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE	DATA TURNAROUND
Pope/Pfister/Wiberg/Tyra	LC Hulstrom	373-3928	TRENT, SJ	8N	
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**	**AIR QUALITY** ☐	45 Days / 45 Days
200-PW2/216-S-7, 199-201.5 ft	200-PW-2/200-PW-4 OU - Borehole Soil Sampling H2936 (7213)		F03-006		
ICE CHEST NO. MNH 12/28/04 AFS044659 GRP-04-004	**FIELD LOGBOOK NO.** HNF-N-336 1	**COA** 119153ES10	**METHOD OF SHIPMENT** Federal Express		
SHIPPED TO Eberline Services	**OFFSITE PROPERTY NO.** SW PTK 14628		**BILL OF LADING/AIR BILL NO.** SW PTK 14628		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS											
A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other		PRESERVATION	None									
		TYPE OF CONTAINER	aG									
		NO. OF CONTAINER(S)	1									
		VOLUME	120mL									
	SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B1B594	SAMPLE ANALYSIS	SEE ITEM (1) IN SPECIAL INSTRUCTIONS									

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B1B5F6	SOIL	12/22/04	1120	X								

CHAIN OF POSSESSION	SIGN/ PRINT NAMES		
RELINQUISHED BY/REMOVED FROM 5-7	DATE/TIME 12/22/04 1120	RECEIVED BY/STORED IN MO-026	DATE/TIME 12/22/04 1325
RELINQUISHED BY/REMOVED FROM MO-026	DATE/TIME 12/28/04 1325	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME 12/29/04 10:30	RECEIVED BY/STORED IN	DATE/TIME 12/29/04 10:30
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

(1)Technetium-99; Isotopic Thorium {Thorium-232} Carbon-14; Iodine-129; Nickel-63; Tritium - H3;

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

0000028

EBERLINE SERVICES

RICHMOND, CA LABORATORY

SAMPLE RECEIPT CHECKLIST

Client: Fluor Hanford City: Richland State: WA

Date/Time received: 12/9/04 10:00 CoC No.: F03-006-297, 316

Container I.D. No.: GRP 04-039 Requested TAT (Days): 45 P.O. Received Yes [ ] No [ ]

INSPECTION

1. Custody seals on shipping container intact? Yes [X] No [ ] N/A [ ]
2. Custody seals on shipping container dated & signed? Yes [X] No [ ] N/A [ ]
3. Custody seals on sample containers intact? Yes [X] No [ ] N/A [ ]
4. Custody seals on sample containers dated & signed? Yes [X] No [ ] N/A [ ]
5. Packing material is: Wet [ ] Dry [X]
6. Number of samples in shipping container: 2 Sample Matrix: Soil
7. Number of containers per sample: ______ (Or see CoC ✓)
8. Samples are in correct container Yes [X] No [ ]
9. Paperwork agrees with samples? Yes [X] No [ ]
10. Samples have: Tape [ ] Hazard labels [ ] Rad labels [ ] Appropriate sample labels [X]
11. Samples are: In good condition [X] Leaking [ ] Broken Container [ ] Missing [ ]
12. Samples are: Preserved [ ] Not preserved [ ] pH ______ Preservative ______
13. Describe any anomalies: ______
14. Was P.M. notified of any anomalies? Yes [ ] No [ ] Date ______
15. Inspected by [signature] Date: 12/9/04 Time: 10:00

Customer Sample No.	cpm	mR/hr	wipe	Customer Sample No.	cpm	mR/hr	wipe
B1B5F6	(1 container)		for	chem.			
B1B5H3	(1 can / 1 Spoon liner)		for	Shaw			

Ion Chamber Ser. No. ______ Calibration date ______

Alpha Meter Ser. No. ______ Calibration date ______

Beta/Gamma Meter Ser. No. ______ Calibration date ______

LvLI
LIONVILLE LABORATORY INC.

Mr. Steve Trent
Fluor Hanford Inc.
825 Jadwin Ave.
Richland, WA 99352

Subject: Contract No. 630
Analytical Data Package

Dear Mr. Trent:

Enclosed are the hard copy analytical reports for the batch number/fraction indicated (marked X) in the following table:

LvLI Batch #	0412L570
SDG #	H2936
SAF #	F03-006
Date Received	1-7-05
# Samples	2
Matrix	Soil
Volatiles	
Semivolatiles	
Pest/PCB	
DRO/GRO/KRO	
Herbicides	
GC Alcohol	
Metals	
Inorganics	X

The electronic data deliverable (EDD) will be emailed shortly. If you have any questions, please don't hesitate to contact me at (610) 280-3012.

Sincerely,
Lionville Laboratory Incorporated

Orlette S. Johnson
Project Manager

r:\group\pm\orlette\tnu-hanford\data\fc_ltrs.doc

Lionville Laboratory, Inc.
INORGANIC ANALYTICAL DATA PACKAGE FOR
TNUHANFORD F03-006 H2936

DATE RECEIVED: 01/07/05 LVL LOT # :0501L570

CLIENT ID /ANALYSIS	LVL #	MTX	PREP #	COLLECTION	EXTR/PREP	ANALYSIS
B1B5F6						
% SOLIDS	001	S	05L%S003	12/22/04	01/10/05	01/10/05
CHROMIUM VI	001	S	05LVI003	12/22/04	01/12/05	01/12/05
NITRATE NITRITE	001	S	05LN3B04	12/22/04	01/19/05	01/19/05
NITRATE NITRITE	001 REP	S	05LN3B04	12/22/04	01/19/05	01/19/05
NITRATE NITRITE	001 MS	S	05LN3B04	12/22/04	01/19/05	01/19/05
OIL & GREASE BY GRAV	001	S	05LOG003	12/22/04	01/14/05	01/15/05
OIL AND GREASE BY GR	001 REP	S	05LOG003	12/22/04	01/14/05	01/15/05
OIL AND GREASE BY GR	001 MS	S	05LOG003	12/22/04	01/14/05	01/15/05
B1B5F7						
% SOLIDS	002	S	05L%S003	12/29/04	01/10/05	01/10/05
CHROMIUM VI	002	S	05LVI003	12/29/04	01/12/05	01/12/05
CHROMIUM VI	002 REP	S	05LVI003	12/29/04	01/12/05	01/12/05
CHROMIUM VI	002 MS	S	05LVI003	12/29/04	01/12/05	01/12/05
CHROMIUM VI	002 MSD	S	05LVI003	12/29/04	01/12/05	01/12/05
NITRATE NITRITE	002	S	05LN3B04	12/29/04	01/19/05	01/19/05
OIL & GREASE BY GRAV	002	S	05LOG003	12/29/04	01/14/05	01/15/05
LAB QC:						
CHROMIUM VI	MB1	S	05LVI003	N/A	01/12/05	01/12/05
CHROMIUM VI	MB1 BS	S	05LVI003	N/A	01/12/05	01/12/05
CHROMIUM VI	MB1 BSD	S	05LVI003	N/A	01/12/05	01/12/05
NITRATE NITRITE	MB1	S	05LN3B04	N/A	01/19/05	01/19/05
NITRATE NITRITE	MB1 BS	S	05LN3B04	N/A	01/19/05	01/19/05
OIL & GREASE BY GRAV	MB1	S	05LOG003	N/A	01/14/05	01/15/05
OIL AND GREASE BY GR	MB1 BS	S	05LOG003	N/A	01/14/05	01/15/05
OIL AND GREASE BY GR	MB1 BSD	S	05LOG003	N/A	01/14/05	01/15/05

LIONVILLE LABORATORY INC.

Analytical Report

Client: TNU-HANFORD F03-006 H2936
LVL#: 0501L570

W.O.#: 11343-606-001-9999-00
Date Received: 01-07-05

INORGANIC NARRATIVE

1. This narrative covers the analyses of 2 soil samples.

2. The samples were prepared and analyzed in accordance with the methods indicated on the attached glossary.

3. Sample holding times as required by the method and/or contract were met.

4. The results presented in this report are derived from samples that met LvLI's sample acceptance policy.

5. The method blanks were within the method criteria.

6. The Laboratory Control Samples (LCS) were within the laboratory control limits.

7. The matrix spike recoveries for Chromium VI, Nitrate Nitrite and Oil and Grease were within the 75-125% control limits.

8. The replicate analyses Chromium VI and Oil and Grease were within the 20% Relative Perecent Difference (RPD) control limit however replicate analysis for Nitrate Nitrite was outside the control limit that may be attributed to sample inhomogeneity.

9. Results for solid samples are reported on a dry weight basis.

10. I certify that this sample data package is in compliance with SOW requirements, both technically and for completeness, other than the conditions detailed above. Release of the data contained in this hard copy package has been authorized by the Laboratory Manager or a designee, as verified by the following signature.

Iain Daniels
Laboratory Manager
Lionville Laboratory Incorporated

1/28/05
Date

njp\01-570

208 Welsh Pool Road • Exton, PA 19341- 1313 • (610) 280-3000 • Fax (610) 280-3041

Lionville Laboratory Incorporated

WET CHEMISTRY

METHODS GLOSSARY FOR SOIL/SOLIDS SAMPLE ANALYSIS

	ASTM	SW846	OTHER
% Ash	__ D2216-80		
% Moisture	__ D2216-80		__ ILMO4.0 (e)
% Solids	✓ D2216-80		__ ILMO4.0 (e)
% Volatile Solids	__ D2216-80		
ASTM Extraction in Water	__ D3987-81/85		
BTU	__ D240-87		
CEC		__ 9081	__ c
Chromium VI		✓ 3060A/7196A	
Corrosivity ___ by coupon ___ by pH		__ 1110(mod) __ 9045C	
Cyanide, Total		__ 9010B	__ ILMO4.0 (e)
Cyanide, Reactive		__ Section 7.3/9014	
Halides, Extractable Organic		__ 9020B	__ EPA 600/4/84-008
Halides, Total		__ 9020B	__ EPA 600/4/84-008
EP Toxicity		__ 1310A	
Flash Point		__ 1010	
Ignitability		__ 1010	
Oil & Grease		✓ 9071A(mod.)	✓ EPA 413.1 (mod.)
Carbon, Total Organic		__ 9060	__ Lloyd Kahn (mod)
Oxygen Bomb Prep for Anions	__ D240-87(mod)	__ 5050	
Petroleum Hydrocarbons, Total Recoverable		__ 9071	__ EPA 418.1
pH, Soil		__ 9045C	
Sulfide, Reactive		__ Section 7.3/9030B	
Sulfide		__ 9030B(mod)	
Specific Gravity	__ D1429-76C/	__ D5057-90	
Sulfur, Total		__ 9056	
Synthetic Preparation Leach		__ 1312	
Paint Filter		__ 9095A	
Other: Nitrate Nitrite	**Method:** EPA 353.2 (mod.)		
Other:	**Method**		

Lionville Laboratory Incorporated

METHOD REFERENCES AND DATA QUALIFIERS

DATA QUALIFIERS

U = Indicates that the parameter was not detected at or above the reported limit. The associated numerical value is the sample detection limit.

* = Indicates that the original sample result is greater than 4x the spike amount added.

ABBREVIATIONS

MB = Method or Preparation Blank.
MS = Matrix Spike.
MSD = Matrix Spike Duplicate.
REP = Sample Replicate
LC = Laboratory Control Sample.
NC = Not calculated.

A suffix of -R, -S, or -T following these codes indicate a replicate, spike or sample duplicate analysis respectively.

ANALYTICAL WET CHEMISTRY METHODS

1. ASTM Standard Methods.

2. USEPA Methods for Chemical Analysis of Water and Wastes (USEPA 600/4-79-020).

3. Test Methods for Evaluating Solid Waste (USEPA SW-846).

a. Standard Methods for the Examination of Water and Waste, 16 ed, (1983).

b. Standard Methods for the Examination of Water and Waste, 17 ed, (1989)/18ed (1992).

c. Method of Soil Analysis, Part 1, Physical and Mineralogical Methods, 2nd ed, (1986).

d. Method of Soil Analysis, Part 2, Chemical and Microbiological Properties, Am. Soc. Agron., Madison, WI (1965).

e. USEPA Contract Laboratory Program, Statement of Work for Inorganic Analysis.

f. Code of Federal Regulations.

Lionville Laboratory, Inc.

INORGANICS DATA SUMMARY REPORT 01/24/05

CLIENT: TNUHANFORD F03-006 H2936 LVL LOT #: 0501L570
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT		UNITS	REPORTING LIMIT	DILUTION FACTOR
-001	B1B5F6	% Solids	98.2		%	0.01	1.0
		Chromium VI	0.20	u	MG/KG	0.20	1.0
		Nitrate Nitrite	3.2		MG/KG	0.20	1.0
		Oil & Grease Gravimetri	679	u	MG/KG	679	1.0
-002	B1B5F7	% Solids	97.0		%	0.01	1.0
		Chromium VI	0.21		MG/KG	0.21	1.0
		Nitrate Nitrite	45.0		MG/KG	1.0	5.0
		Oil & Grease Gravimetri	687	u	MG/KG	687	1.0

Lionville Laboratory, Inc.

INORGANICS METHOD BLANK DATA SUMMARY PAGE 01/24/05

CLIENT: TNUHANFORD F03-006 H2936 LVL LOT #: 0501L570
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	RESULT	UNITS	REPORTING LIMIT	DILUTION FACTOR
BLANK10	05LVI003-MB1	Chromium VI	0.20 u	MG/KG	0.20	1.0
BLANK10	05LN3B04-MB1	Nitrate Nitrite	0.20 u	MG/KG	0.20	1.0
BLANK10	05LOG003-MB1	Oil & Grease Gravimetri	667 u	MG/KG	667	1.0

Lionville Laboratory, Inc.

INORGANICS ACCURACY REPORT 01/24/05

CLIENT: TNUHANFORD F03-006 H2936 LVL LOT #: 0501L570
WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	SPIKED SAMPLE	INITIAL RESULT	SPIKED AMOUNT	%RECOV	DILUTION FACTOR (SPK)
-001	B1B5F6	Nitrate Nitrite	8.6	3.2	5.1	106.6	1.0
		Oil & Grease Gravimetr	8420	679 u	8940	94.1	1.0
-002	B1B5F7	Soluble Chromium VI	4.2	0.21	4.1	97.8	1.0
		Insoluble Chromium VI	1340	0.21	1180	113.8	100
BLANK10	05LVI003-MB1	Soluble Chromium VI	4.0	0.20u	4.0	100.2	1.0
		Insoluble Chromium VI	1240	0.20u	1170	106.1	100
BLANK10	05LN3B04-MB1	Nitrate Nitrite	5.1	0.20u	5.0	102.8	1.0
BLANK10	05LOG003-MB1	Oil & Grease Gravimetr	8210	667 u	8790	93.5	1.0

Lionville Laboratory, Inc.

INORGANICS PRECISION REPORT 01/24/05

CLIENT: TNUHANFORD F03-006 H2936 LVL LOT #: 0501L570

WORK ORDER: 11343-606-001-9999-00

SAMPLE	SITE ID	ANALYTE	INITIAL RESULT	REPLICATE	RPD	DILUTION FACTOR(REP)
-001REP	B1B5F6	Nitrate Nitrite	3.2	0.23	173.0	1.0
		Oil & Grease Gravimetri	679 u	679 u	NC	1.0
-002REP	B1B5F7	Chromium VI	0.21	0.26	19.4	1.0

Lionville Laboratory Use Only

0501L570

Custody Transfer Record/Lab Work Request

LvLI

See SRC

FIELD PERSONNEL: COMPLETE ONLY SHADED AREAS

Client: INL Hanford F03-006

Est. Final Proj. Sampling Date:

Project #: 11393 606 001 9999 00

Project Contact/Phone #:

Lionville Laboratory Project Manager: DJ

QC: Spec Del: Std TAT: 30 Days

Date Rec'd: 1/7/05 Date Due: 2/6/05

Refrigerator #										4 A	
#/Type Container	Liquid										
	Solid									1A6L	
Volume	Liquid										
	Solid									120	
Preservatives											
ANALYSES REQUESTED →		ORGANIC: VOA	BNA	Pest/PCB	Herb				INORG: Metal	CN	CR6 oil/gr	NO3/NO2

MATRIX CODES:
S - Soil
SE - Sediment
SO - Solid
SL - Sludge
W - Water
O - Oil
A - Air
DS - Drum Solids
DL - Drum Liquids
L - EP/TCLP Leachate
WI - Wipe
X - Other
F - Fish

↓ Lionville Laboratory Use Only ↓

Lab ID	Client ID/Description	Matrix QC Chosen (✓) MS	MSD	Matrix	Date Collected	Time Collected	ICR6 IOGGR	IN3N2
001	B1B5F6			S	12/22/04	1120	1	✓
002	↓ F7			L	12/29/04	0930	1	✓

Special Instructions:

RUN MATRIX QC

DATE/REVISIONS:
1.
2.
3.
4.
5.
6.

Relinquished by	Received by	Date	Time
FedEx	[signature]	1/7/05	1935

Relinquished by	Received by	Date	Time

Relinquished by	Received by	Date	Time
"COMPOSITE WASTE"	ORIGINAL REWRITTEN		

COLLECTOR Pope/Pfister/Wiberg/Tyra	**COMPANY CONTACT** LC Hulstrom	**TELEPHONE NO.** 373-3928	**PROJECT COORDINATOR** TRENT, SJ	**PRICE CODE** 8N / **AIR QUALITY** ☐ / **DATA TURNAROUND** 45 Days / 45 Days
SAMPLING LOCATION 200-PW2/216-S-7, 199-201.5ft	**PROJECT DESIGNATION** 200-PW-2/200-PW-4 OU - Borehole Soil Sampling		**SAF NO.** F03-006	
ICE CHEST NO. MAB 1/4/05 AFS040559 SHAS-500	**FIELD LOGBOOK NO.** HNF-N-336 1	**COA** 119153ES10	**METHOD OF SHIPMENT** Federal Express	
SHIPPED TO Lionville Laboratory Incorporated	**OFFSITE PROPERTY NO.** SU PTC 14629		**BILL OF LADING/AIR BILL NO.** SU PTC 14629	

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS												
A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other		**PRESERVATION**	Cool 4C										
		TYPE OF CONTAINER	aG										
		NO. OF CONTAINER(S) / **VOLUME**	1 / 120mL										
	SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: B1B594	**SAMPLE ANALYSIS**	SEE ITEM (1) IN SPECIAL INSTRUCTIONS										

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME										
B1B5F6	SOIL	12/22/04	1120	X									

CHAIN OF POSSESSION		SIGN/ PRINT NAMES	
RELINQUISHED BY/REMOVED FROM 5-7	DATE/TIME 12/22/04 1325	RECEIVED BY/STORED IN AMO-026	DATE/TIME 12/22/04 1325
RELINQUISHED BY/REMOVED FROM	DATE/TIME 1/6/05 0850	RECEIVED BY/STORED IN M.H. Barker/M.D. Barker	DATE/TIME 1/6/05 0850
RELINQUISHED BY/REMOVED FROM M.H. Barker/M.D. Barker	DATE/TIME 1/6/05 0850	RECEIVED BY/STORED IN Fed Ex	DATE/TIME
RELINQUISHED BY/REMOVED FROM Fedex	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME 1/7/05 0935
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME

SPECIAL INSTRUCTIONS

(1)Chromium Hex - 7196; Oil & Grease - 413.1; NO2/NO3 - 353.2;

① Changed time per sample log sheet MAB 1/6/05

LABORATORY SECTION	**RECEIVED BY**	**TITLE**	**DATE/TIME**
FINAL SAMPLE DISPOSITION	**DISPOSAL METHOD**	**DISPOSED BY**	**DATE/TIME**

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-309	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Wiberg/Tyra	LC Hulstrom	373-3928	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
200-PW2/216-S-7, 223-225.5FT	200-PW-2/200-PW-4 OU - Borehole Soil Sampling		F03-006		
ICE CHEST NO. MAB 1/6/05 AFS046039 SAWS-300	**FIELD LOGBOOK NO.**	**COA** 119153ES10	**METHOD OF SHIPMENT** Federal Express		
SHIPPED TO Lionville Laboratory Incorporated	**OFFSITE PROPERTY NO.** Su PTR 14629		**BILL OF LADING/AIR BILL NO.** Su PTR 14629		

MATRIX*
A=Air
DL=Drum Liquids
DS=Drum Solids
L=Liquid
O=Oil
S=Soil
SE=Sediment
T=Tissue
V=Vegitation
W=Water
WI=Wipe
X=Other

POSSIBLE SAMPLE HAZARDS/ REMARKS

SPECIAL HANDLING AND/OR STORAGE
RADIOACTIVE TIE TO: B1B595

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME	PRESERVATION	TYPE OF CONTAINER	NO. OF CONTAINER(S)	VOLUME	SAMPLE ANALYSIS
B1B5F7	SOIL	12/29/04	0930	Cool 4C	aG	1	120mL	SEE ITEM (1) IN SPECIAL INSTRUCTIONS: X

CHAIN OF POSSESSION / **SIGN/ PRINT NAMES**

RELINQUISHED BY/REMOVED FROM	DATE/TIME	RECEIVED BY/STORED IN	DATE/TIME
Dana Wiberg [signature] 5-7	12/29/04 0930	Site Freight MO-026	12/29/04 1115
MO-026 [signature]	1/6/05 0840	M.H. Buchheim M.L. Buchheim	1/6/05 0840
M.H. Buchheim M.L. Buchheim	1/6/05 0840	[signature]	
FedEx		JPenny	1/7/05 0935

SPECIAL INSTRUCTIONS
(1)Chromium Hex - 7196; Oil & Grease - 413.1; NO2/NO3 - 353.2;

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME

Lionville Laboratory Incorporated

SAMPLE RECEIPT CHECKLIST (SRC)

CLIENT: TNU Hanford — Date: 1/7/05

Purchase Order / Project# / RF# / SOW# / Release #:

LvLI Batch # : 0501L570 — Sample Custodian: TH JR 1/7/05 [signature]

NOTE: EXPLAIN ALL DISCREPANCIES

1. Samples Hand Delivered or Shipped (circled: Shipped) — Carrier FedEx — Airbill# 791438305822

		Yes	No		Comments
2.	Custody seals on coolers or shipping container intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
3.	Outside of coolers or shipping containers are free from damage?	☑ Yes	☐ No		
4.	All expected paperwork received (coc and other client specific information) sealed in plastic bag and easily accessible?	☑ Yes	☐ No		
5.	Samples received cooled or ambient? (circled: cooled)	Temp 1.0 °C		Cooler # 500	
6.	Custody seals on sample containers intact, signed and dated?	☑ Yes	☐ No	☐ No Seals	
7.	coc signed and dated?	☑ Yes	☐ No		
8.	Sample containers are intact?	☑ Yes	☐ No		
9.	All samples on coc received? All samples received on coc?	☑ Yes	☐ No		
10.	All sample label information matches coc?	☑ Yes	☐ No		
11.	Samples properly preserved?	☑ Yes	☐ No		
12.	Samples received within hold times? Short holds taken to wet lab?	☑ Yes	☐ No		
13.	VOA, TOC, TOX free of headspace?	☐ Yes	☐ No	☑ N/A	
14.	QC stickers placed on bottles designated by client?	☐ Yes	☐ No	☑ N/A	
15.	Shipment meets LvLI Sample Acceptance Policy? (Identify all bottles not within policy. See reverse side for policy)	☑ Yes	☐ No		
16.	Project Manager contacted concerning discrepancies? name/date (or samples outside criteria)	☐ Yes	☐ No	☑ No Discrepancies	

SR-002-B

Shaw™
Shaw E & I, Inc.

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PO Box 4339
1570 Bear Creek Road
Oak Ridge TN 37830
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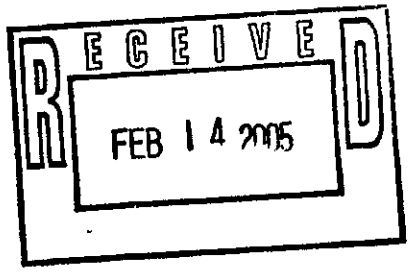
CERTIFICATE OF ANALYSIS

Stephen Trent
Fluor Hanford, Inc.
825 Jadwin Avenue
Richland, Washington 99352

February 10, 2005

This is the Certificate of Analysis for the following samples:

Shaw Project ID:	**Eberline - Hanford**
Shaw Project Number:	**100846.53000000**
Client Sample Data Group:	H2936
Date Received by Lab:	January 3, 2005
Number of Samples:	One (1)
Sample Type:	Soil



I. Introduction/Case Narrative

One soil sample was received by the Shaw Geotechnical Laboratory on January 3, 2005. The sample was submitted for determination of moisture content, bulk density, and sieve analysis. The sample number received was B1B5H3.

Please see Appendix A, Sample Number Cross Reference List; Appendix B, Analysis Results; and Appendix C, Chain-of-Custody/Sample Receipt Records.

"I certify that this data package is in compliance with the SOW, both technically and for completeness, for other than the conditions detailed above. Release of the data contained in this hardcopy data package has been authorized by the Laboratory Manager or a designee, as verified by the following signature."

Reviewed and Approved:

Ralph Cole
Laboratory Manager, Geotechnical Services

Shaw Geotechnical Laboratory
Oak Ridge TN
(865) 482-6497

II. Analytical Results/Methodology

REFERENCES: United States Army Corps of Engineers (USACE), Engineer Manual 1110-2-1906, *Laboratory Soils Testing*, appendix II, 1970; United States Environmental Protection Agency, SW846, *Test Methods for Examining Solid Waste, Physical/Chemical Methods*, 3rd ed., Nov 1986 (EPA SW-846). Annual Book of ASTM Standards, Section 4, Construction, Volume 04.08, *Soil and Rock (I)*, and Volume 04.09, *Soil and Rock (II)*, 2004. Shaw Environmental and infrastructure, Standard Operating Procedures.

Moisture Content of Soil and Rock..... **ASTM D 2216**
Particle-size Analysis of Soils ..... **ASTM D 422**
Bulk Density of Soils..... **EM 1110-2-1906**

III. Quality Control

Quality control checks such as duplicates and spikes (QC samples), are not normally applicable to geotechnical testing. This is due largely to the inability of obtaining samples with known characteristics, the heterogenous nature of the samples, and quality control procedures built-in to the analytical method.

QC measures to ensure accuracy and precision of test results include the following:

- 100% verification of all numerical results - raw data entries, transcriptions and calculations entered by lab technicians are checked, recalculated and verified. Most data calculations are performed by computer programs.
- Data validation through test reasonableness - summaries of all test results for individual reports are reviewed to determine the overall reasonableness of data and to determine the presence of any data that may be considered outliers.
- Quality control procedures are built into most standardized geotechnical procedures. For example, liquid limit and plastic limit analyses call for re-analyses and specify acceptance criteria.
- Routine instrument calibration - instruments, gauges and equipment used in testing are calibrated on a routine basis. All instrument calibration follows ASTM or manufacturer guidelines.
- Maintenance of all past calibration records - calibration records and certification documents of all instruments, gauges and equipment are updated routinely and maintained in the Quality Control Coordinators Quality/Operations files.

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- Certified and trained personnel - all technicians are certified by the National Institute for Certification of Engineering Technicians (NICET) in geotechnical soil testing, and are trained in the application of standard laboratory procedures for geotechnical analyses as well as the quality assurance measures implemented by Shaw.

- Quantitative analyses frequently used in geotechnical/physical testing programs do not use QC tools common to wet chemistry or radiochemistry laboratories. Measures not employed in the analysis of samples reported in this report include: laboratory control samples (LCS), blanks, matrix spikes (MS), duplicate analyses, dilutions, digestions, correction factors, surrogate sample analyses, detection limit determinations, control charts, and/or tentatively identified compounds (TICs).

IV. Data Qualification

None.

Appendix A
Sample Cross-Reference List

February 10, 2005
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.53000000
SDG No. H2936

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SAMPLE NUMBER CROSS-REFERENCE LIST

LAB SAMPLE NO.	CLIENT SAMPLE NO.	MATRIX
BC0521	B1B5H3	Soil

Appendix B
Sample Test Results

February 10, 2005
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.53000000
SDG No. H2936

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MOISTURE CONTENT

PROJECT NAME
Eberline Hanford

PROJECT NUMBER
100846.53000000

LAB SAMPLE NO	CLIENT SAMPLE NO	MOISTURE, % ASTM D 2216	MOISTURE , % SW846	SOLIDS, % SW846
BC0521	B1B5H3	1.8	1.7	98.3

ASTM D 2216 results are based on dry sample weight.
SW846 results are based on wet sample weight.
Solids content is determined by subtracting the SW846 moisture (%) from 100.

February 10, 2005
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BULK DENSITY/DRY DENSITY
EM-1110-2-1906, APPENDIX II

PROJECT NAME: **Eberline - Hanford**

PROJECT NUMBER: **100846.53000000**

LAB SAMPLE NUMBER	CLIENT SAMPLE NUMBER	AVERAGE LENGTH inches	AVERAGE DIAMETER inches	WET WEIGHT grams	MOISTURE CONTENT %	BULK DENSITY pcf	DRY DENSITY pcf
BC0521	B1B5H3	5.4340	3.9058	2300.1	2.5	134.6	131.4

Moisture content calculated by ASTM D 2216 based on sample dry weight.
Bulk density is the weight of wet sample divided by the volume of the wet sample (as-received).
Dry density is the weight of the dry sample solids divided by the volume of the original sample.

February 10, 2005
Stephen Trent
Fluor Hanford, Inc.
Shaw Project Name: Eberline Hanford
Shaw Project No. 100846.53000000
SDG No. H2936

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Oak Ridge TN
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PARTICLE-SIZE DISTRIBUTION
ASTM D 422

Project Name Eberline Hanford

Project No. 100846.53000000

Field Sample No. B1B5H3

Lab Sample No. BC0521

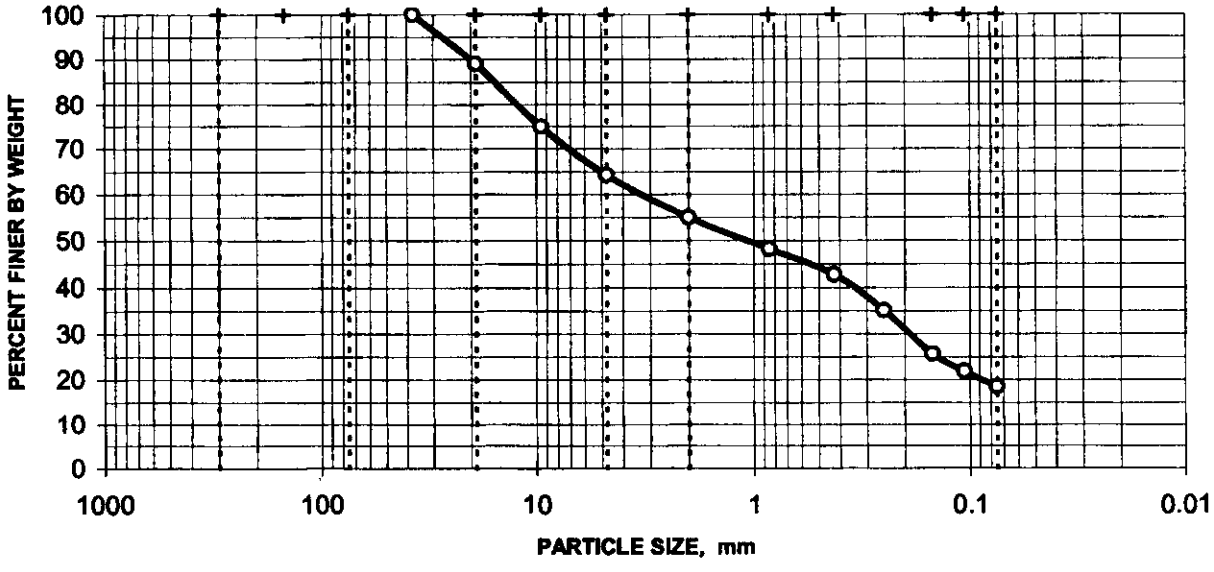
Moisture Content = 2.5%
based on dry sample weight

SIEVE ANALYSIS

	Sieve No.	Diameter mm	Percent Finer
COARSE	3"	75.000	100.0%
	1.5"	37.500	100.0%
	0.75"	19.000	89.1%
	0.375"	9.500	74.9%
	#4	4.750	64.2%
	#10	2.000	55.0%

	Sieve No.	Diameter mm	Percent Finer
FINE	#20	0.850	48.2%
	#40	0.425	42.8%
	#60	0.250	35.1%
	#100	0.149	25.7%
	#140	0.106	21.9%
	#200	0.075	18.5%

DISTRIBUTION CURVE



35.8% Gravel 45.7% Sand 18.5% Silt/Clay

00000069

Appendix C
Chain-of-Custody and Request-for-Analysis Records

FLUOR Hanford Inc.	CHAIN OF CUSTODY/SAMPLE ANALYSIS REQUEST	F03-006-316	PAGE 1 OF 1

COLLECTOR	COMPANY CONTACT	TELEPHONE NO.	PROJECT COORDINATOR	PRICE CODE 8N	DATA TURNAROUND
Pope/Pfister/Wilberg/Tyra	LC Hulstrom	373-3928	TRENT, SJ	AIR QUALITY ☐	45 Days / 45 Days
SAMPLING LOCATION	**PROJECT DESIGNATION**		**SAF NO.**		
200-PW2/216-S-7,199-201.5 ft	200-PW-2/200-PW-4 OU - Borehole Soil Sampling		F03-006		
ICE CHEST NO. ~~AFS04059~~ GRP-04-009 MAB 12/28/04	**FIELD LOGBOOK NO.** HNF-N-336 1	**COA** 119153ES10	**METHOD OF SHIPMENT** Federal Express		
SHIPPED TO Shaw Group	**OFFSITE PROPERTY NO.** SW PTK 14628		**BILL OF LADING/AIR BILL NO.** SW PTK 14628		

MATRIX*	POSSIBLE SAMPLE HAZARDS/ REMARKS											
A=Air, DL=Drum Liquids, DS=Drum Solids, L=Liquid, O=Oil, S=Soil, SE=Sediment, T=Tissue, V=Vegitation, W=Water, WI=Wipe, X=Other	QDG4 H2936	**PRESERVATION**	None	None								
		TYPE OF CONTAINER	Moisture Resistant Cont	Split Spoon Liner								
		NO. OF CONTAINER(S)	1	1								
		VOLUME	200g	1000g								
	SPECIAL HANDLING AND/OR STORAGE RADIOACTIVE TIE TO: ~~B1B598~~ B1B5G4 MAB 12/28/04	**SAMPLE ANALYSIS**	Moisture Content - D2216;	Particle Size (Dry Sieve) - D422; Bulk Density - D2937								

SAMPLE NO.	MATRIX*	SAMPLE DATE	SAMPLE TIME									
B1B5H3	SOIL	12/22/04	1120	X	X							

BC 0521

CHAIN OF POSSESSION	SIGN/ PRINT NAMES	SPECIAL INSTRUCTIONS
RELINQUISHED BY/REMOVED FROM S-7 DATE/TIME 12/22/04 1120	RECEIVED BY/STORED IN 241-B-026 DATE/TIME 12/22/04 1325	LINER Weight 2960 grams
RELINQUISHED BY/REMOVED FROM DATE/TIME 12/28/04 0825	RECEIVED BY/STORED IN DATE/TIME 12/28/04 0825	
RELINQUISHED BY/REMOVED FROM DATE/TIME 12/28/04 0825	RECEIVED BY/STORED IN DATE/TIME	
RELINQUISHED BY/REMOVED FROM DATE/TIME Fed Ex 12/29/04 1000	RECEIVED BY/STORED IN DATE/TIME 12/29/04 10.00	
RELINQUISHED BY/REMOVED FROM DATE/TIME 12/30/04 5:00	RECEIVED BY/STORED IN DATE/TIME Fed Ex 12/30/04	
RELINQUISHED BY/REMOVED FROM DATE/TIME	RECEIVED BY/STORED IN DATE/TIME	
RELINQUISHED BY/REMOVED FROM DATE/TIME	RECEIVED BY/STORED IN DATE/TIME	

LABORATORY SECTION	RECEIVED BY	TITLE	DATE/TIME	
		R50	1-3-05 @1000	
FINAL SAMPLE DISPOSITION	DISPOSAL METHOD	DISPOSED BY	DATE/TIME	

SDG# H2936

PAGE 1 Eberline Srvces CHAIN OF CUSTODY ORD # R4-12-301

12/29/04 14:22:20 WORK ID: SAF# F03-006 SDG H2936

RCVD: 12/29/04 DUE: 02/12/05 KEEP: 02/12/06 DISP: S

DASH	SAMPLE IDENTIFICATION	STORED	TESTS			
01A-S	B1B5H3	SHAW	DISPOS	E331S	E333S	E335S

RELEASED BY	DATE	TRANSFERRED TO	DATE	RECEIVED BY	DATE
[signature]	12/30/04	Shaw	12/30/04	[signature]	1-3-05

BC 0521